REMARKS

The above Amendments and these Remarks are in reply to the Office Action mailed September 3, 2003.

Currently, claims 1-44 are pending in the application. Applicants have amended claims 10, 22-24, 26-29, 31-37, and 39-43, and added claims 45-58. Applicants respectfully request reconsideration of claims 1-44 and consideration of claims 45-58.

I. Rejection of claims 1, 4-10, 17, 22-23, 27-28, 32, 35-36, and 40 under 35 U.S.C. § 102(e)

Claims 1, 4-10, 17, 22-23, 27-28, 32, 35-36, and 40 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,057,833 (*Heidmann*). Because *Heidmann* does not disclose each of the limitations of these claims, Applicants assert that claims 1, 4-10, 17, 22-23, 27-28, 32, 35-36, and 40 are patentable over the cited art.

A. Claims 1, 4-10, and 17

Prior art systems "survey the environment being captured in the video and the location of each camera. By knowing where the object to be highlighted is in the environment, where the camera is in relation to the environment and where the camera is pointing to, the system can determine where to edit the video." *Id.* at ll. 1-4. In some situations, these systems can be problematic given that "surveying the environment and the camera location can be expensive and time consuming" and that "there are instances where it is impossible or impractical to survey the environment being captured in the video." *Id.* at ll. 5-8.

Applicants teach that the "use of a virtual surface allows for the system to be successfully operated <u>without</u> surveying the environment being captured in the video and the location of each camera. This is because the operator chooses a virtual surface (e.g. a sphere, plane, etc) and chooses where that surface lies in a coordinate system having an origin at a position with a known relation to the camera." *Specification*, p. 2, ll. 23-27 (*emphasis added*). In many embodiments, "the virtual surface is not an attempt to approximate a real surface. Rather, it is a surface that does not exist in the real world." *Specification*, p. 13, ll. 1-3. The virtual surface is created at a desired position and used in the conversion of positions in a first video image to positions in a second video image. These features are encompassed in claim 1, which recites

"converting said one or more positions [in a first image] to one or more locations in relation to a virtual surface."

Heidmann, however, is directed to defining objects or positions in 3 dimensions in a three-dimensional space using known distances and levels respective to actual surfaces. Heidmann uses the term "virtual surface," however, he uses that term to mean something different than in Applicant's claim 1. The "virtual surface" disclosed by Heidmann appears to be an approximation or representation of a real surface. Heidmann teaches that "graphical elements may be drawn onto a virtual surface which can be moved or animated in 2D or 3D, that is either scaled or slid around on the screen, or tumbled, viewed in perspective, warped, etc." Heidmann, col. 13, ll. 7-10. Heidmann provides a single example whereby "a basketball play can be diagrammed on the surface of a court, then the court can be moved in perspective to view the diagram from different angles." Id. at ll. 10-13. Heidmann describes that the virtual surface can be "viewed in perspective" and then states in the example that "the court can be moved in perspective." Id. The court (or some representation thereof) appears to be the virtual surface in this example. There is no conversion of positions identified in a first image to "locations in relation to a virtual surface," as recited in claim 1, taught or suggested by Heidmann.

Heidmann further describes that, "objects are three-dimensional objects located in a three-dimensional space." Heidmann, col. 12, ll. 43-51. As described with respect to FIGS. 10A & 10B, an "animation object may be defined as projected onto the [playing] field which is defined as a plane or the animation object may be defined as floating a certain known distance above the known level of the playing field." Id. (emphasis added). Thus, Heidmann teaches the use of known distances and known levels in relation to an actual surface (the playing field) to translate the three-dimensional coordinates of an object to three-dimensional coordinates in a camera's frame of reference.

Applicants use "virtual surface" differently than Heidmann. As described in Applicants' Specification, the "virtual surface is not an attempt to approximate a real surface," and does not exist in the real world. Specification, p. 13, ll. 1-5. Thus, there is "no need to measure the three dimensional position of the camera in relation to the surface because the virtual surface is created to be at a desired position with respect to the camera." Id. (emphasis added). Heidmann, however, teaches the definition of positions in terms of the actual environment being captured by defining an object "as projected onto the field" or "as floating a certain known distance above the

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known level of the <u>playing field</u>." *Heidmann*, col. 12, ll. 45-48 (*emphasis added*). Rather than definining positions using known distances in relation to an actual surface as described by *Heidmann*, Applicants teach that a position or location can be defined using an arbitrary virtual surface having a known relation to a camera.

Because *Heidmann* does not disclose "converting said one or more positions to one or more locations in relation to a virtual surface," Applicants assert that claim 1 is patentable over the cited art. Claims 4-10 and 17 each ultimately depend from claim 1 and should be patentable for at least the reasons set forth with respect to claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1, 4-10, and 17 under 35 U.S.C. § 102(e).

B.   Claims 22-23, 35-36, and 40

Amended claims 22 and 35 recite, "determining one or more locations in relation to a virtual surface." As set forth above with respect to claim 1, *Heidmann* does not disclose "converting said one or more positions to one or more locations in relation to a virtual surface." For at least the same reasons as set forth above, Applicants assert that *Heidmann* does not disclose "determining one or more locations in relation to a virtual surface."

Claims 22 and 35 further define the virtual surface, reciting that "said virtual surface is different from said actual surface depicted in said first video image." *Heidmann*, however, teaches that an "animation object can be defined as projected onto the field which is defined as a plane or the animation object may be defined as floating a certain known distance above the known level of the playing field." *Heidmann*, col. 12, ll. 45-48. *Heidmann* further teaches that "graphical elements may be drawn onto a virtual surface which can be moved or animated in 2D or 3D" and provides an example whereby "a basketball play can be diagrammed on the surface of a court, then the <u>court</u> can be moved in perspective." *Id.* at col. 13, ll. 7-13 (*emphasis added*). Thus, *Heidmann* teaches a definition of objects in terms of distances and levels in relation to an actual surface and a virtual surface representing an actual surface (e.g., the basketball court). *Heidmann* makes no suggestion of a "virtual surface [that] is different from said actual surface depicted in said first video image," as recited in claims 22 and 35.

Since *Heidmann* does not disclose each of the limitations of claims 22 and 35, Applicants assert that claims 22 and 35 are patentable over the cited art under 35 U.S.C. § 102(e). Claim 23 depends from claim 22 and claims 36 and 40 each depend from claim 35. Applicants assert that

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claims 23, 36, and 40 are patentable for at least the same reasons set forth with respect to claims 22 and 35. Applicants respectfully request withdrawal of the rejection of claims 22-23, 35-36, and 40 under 35 U.S.C. § 102(e).

C. Claims 27-28 and 32

Amended claim 27 recites, "determining one or more locations in relation to a virtual surface." As set forth above with respect to claim 1, *Heidmann* does not disclose "converting said one or more positions to one or more locations in relation to a virtual surface." For at least the same reasons as set forth above, Applicants assert that *Heidmann* does not disclose "determining one or more locations in relation to a virtual surface," as recited in claim 27.

Claim 27 further defines the virtual surface, reciting that "said virtual surface is of a different shape than said actual surface depicted in said first video image." As previously discussed, any virtual surface disclosed by *Heidmann* is related to an actual surface. For example, *Heidmann* teaches the definition of an animation object "as projected onto the field which is defined as a plane." *Heidmann*, col. 12, ll. 45-46. *Heidmann* further teaches that "graphical elements may be drawn onto a virtual surface," reciting that "a basketball play can be diagrammed on the surface of a court, then the court can be moved in perspective." *Id.* at col. 13, ll. 7-13. The virtual surface disclosed by *Heidmann* is a representation of an actual surface and would appear to be shaped in accordance with the actual surface it represents. *Heidmann* makes no suggestion of a "virtual surface [that] is of a different shape than said actual surface depicted in said first video image," as recited in claim 27.

Since *Heidmann* does not disclose each of the limitations of claim 27, Applicants assert that claim 27 is patentable over the cited art under 35 U.S.C. § 102(e). Claims 28 and 32 depend from claim 27 and should be patentable for at least the same reasons set forth with respect to claim 27. Applicants respectfully request withdrawal of the rejection of claims 27-28 and 32 under 35 U.S.C. § 102(e).

II. Rejection of Claims 2, 3, 11-16, 18-21, 24-26, 29-31, 33-34, 37-39, and 41-44 under 35 U.S.C. § 103(a)

As set forth above, *Heidmann* does not disclose each of the limitations of claims 1, 22, 27, and 35. Applicants further assert that there is no teaching or suggestion for each of the

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limitations of claims 1, 22, 27, and 35. *Heidmann* is directed to a system and method for using known distances in relation to actual surfaces and makes no suggestion for converting or determining locations in relation to a virtual surface as claimed by Applicants. Claims 2-3, 11-16, and 18-21 each ultimately depend from claim 1, claims 24-26 each ultimately depend from claim 22, claims 29-31 and 33-34 each ultimately depend from claim 27, and claims 37-39 and 41-44 each ultimately depend from claim 35. Accordingly, Heidmann does not teach or suggest each of the limitations of these dependent claims for at least the same reasons as set forth with respect to claims 1, 22, 27, and 35. Thus, Applicants assert that claims 2-3, 11-16, 18-21, 24-26, 29-31, 33-34, 37-39, and 41-44 are patentable over the cited art under 35 U.S.C. § 103(a).

III.   New Claims

A.   Claims 45-58

Claims 45-48 each ultimately depend from claim 1 and should be patentable over the cited art for at least the reasons set forth above with respect to claim 1. Claims 49 and 50 each ultimately depend from claim 22 and should be patentable over the cited art for at least the reasons set forth above with respect to claim 22.

B.   Claims 51-58

Claim 51 recites "converting said one or more positions to one or more locations in relation to said virtual surface." For the reasons set forth above with respect to claim 1, Applicants assert that *Heidmann* does not teach or suggest this limitation.

Claim 51 further recites, "defining a virtual surface, wherein a portion of said virtual surface is defined at a desired position in proximity to a portion of an environment to be enhanced in an image depicting said environment." As discussed above, *Heidmann* teaches a definition of objects in terms of known distances and levels in relation to an actual surface. Any virtual surface disclosed by *Heidmann* appears to be a representation of an actual surface such that the definition of the virtual surface is dictated by the actual surface. Claim 51, however, recites that a portion of the virtual surface is "defined at a <u>desired</u> position in proximity to a portion of an environment."

Accordingly, Applicants assert that claim 51 is patentable over the cited art. Claims 52-58 each ultimately depend from claim 51 and should be patentable for at least the same reasons

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set forth with respect to claim 51.

IV.   Conclusion

Based on the above amendments and these remarks, reconsideration of claims 1-44 and consideration of claims 45-58 is respectfully requested.
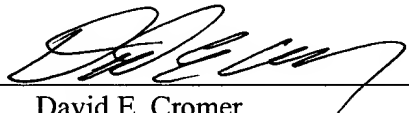
The Examiner's prompt attention to this matter is greatly appreciated. Should further questions remain, the Examiner is invited to contact the undersigned attorney by telephone.

Enclosed is a PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. § 1.136 for extending the time to respond up to and including today, December 19, 2003.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

Date: _December 19, 2003_   By: _____

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